DEVICES FOR OPTICAL TELECOMMUNICATIONS AND ASSOCIATED METHODS.

Devices utilize elements carried by a fluid in a microchannel toswitch, attenuate, shutter, filter, or phase shift optical signals. In certain embodiments, a microchannel carries a gaseous or liquid slug that interacts with at least a portion of the optical power of an optical signal traveling through a waveguide. The microchannel may form part of the cladding of the waveguide, part of the core and the cladding, or part of the core only. The microchannel may also have ends or may be configured as a loop or continuous channel. The fluid devices may be self-latching or may be semi-latching. The fluid in the microchannel is moved using e.g., e.g., electrocapillarity, differential-pressure electrocapillarity, electrowetting, continuous electrowetting, electrophoresis, electroosmosis, dielectrophoresis, electro-hydrodynamic electrohydrodynamic pumping, magneto-hydrodynamic magnetohydrodynamic pumping, thermocapillarity, thermal expansion, dielectric pumping, and/or variable dielectric pumping.